WEST

Generate Collection Print

L2: Entry 1 of 3 File: PGPB Mar 13, 2003

PGPUB-DOCUMENT-NUMBER: 20030049697
PGPUB-FILING-TYPE: new
DOCUMENT-IDENTIFIER: US 20030049697 A1

TITLE: Family of mechanosensitive human potassium channels activated by polyunsaturated fatty acids and their use

PUBLICATION-DATE: March 13, 2003

INVENTOR-INFORMATION:

NAME	CITY	STATE	COUNTRY	RULE-47
Lazdunski, Michel	Nice		FR	
Lesage, Florian	Nice		FR	
Maingret, Francois	Antibes		FR	

US-CL-CURRENT: 435/7.21

CLAIMS:

1. A method of screening for a substance comprising: contacting a sample containing the substance which prevents and/or treats, in human or animal subjects, at least one of cardiac pathologies, vascular pathologies, endocrine pathologies associated with anomalies in hormone secretion, muscle pathologies and/or pathologies of the retina, modulates the activity of the potassium channel activated by polyunsaturated fatty acid and riluzole, and is represented by SEQ ID No. 2 or a functionally equivalent derivative of the sequence, with cells expressing the potassium channel; measuring effects of the substance on potassium channel transport activity; and identifying the substance based on the measured effects.

2. The method of claim 1, wherein the polyunsaturated fatty acid is arachidonic acid.

3. A method of diagnosing, in a human or animal subject, a cardiac disease, a vascular disease, an endocrine disease associated with anomalies in hormone secretion, a muscle disease and/or a pathology of the retina involving a mechanosensitive potassium channel represented as SEQ ID No. 2, a gene coding the channel or a functionally equivalent derivative of the sequence and activated by polyunsaturated fatty acid and riluzole comprising: contacting a biological sample from the subject with an antibody or a mixture of antibodies against said potassium channel; and detecting the presence or absence of the mechanosensitive potassium channel in the sample.

4. The method of claim 3, wherein the polyunsaturated fatty acid is arachidonic acid.

5. The method according to claim 3, wherein nucleic acids contained in the sample are contacted with one or more nucleotide probes capable of hybridizing with a nucleic acid molecule coding the potassium channel or a functionally equivalent derivative thereof.

6. The method according to claim 3, further comprising determining in the genome of cells present in the sample and localization of a gene coding the mechanosensitive

potassium channel.

7. An isolated and purified nucleic acid molecule comprising at least one sequence coding for a protein constituting the hTRAAK, the amino acid sequence of which is SEQ ID NO: 2 or a functionally equivalent derivative of the sequence.

8. The nucleic acid molecule according to claim 2, wherein the sequence is SEQ ID NO: 1.

9. A vector containing the nucleic acid molecule according to claim 7.

10. A vector comprising the nucleic acid molecule of claim 8.

11. A cell transformed with the vector of claim 9, which cell is selected from the group consisting of prokaryotes and eukaryotes.

12. The transformed cell of claim 10 which is a yeast, insect cell, plant cell or mammation cell.

13. The transformed cell of claim 10 which is a bacterium.

14. A method for expression and isolation of a potassium transport channel encoded by a nucleic acid molecule according to claim 1 in a competent host cell comprising transferring a vector including said nucleic acid molecule into a competent host cell, culturing said host cell under conditions allowing the production of the potassium transport channel, and isolating and purifying the polypeptide comprising the potassium transport channel.

15. A pharmaceutical composition for treating and/or preventing at least one of cardiac pathologies, vascular pathologies, endocrine pathologies associated with anomalies in hormone secretion, muscle pathologies and/or pathologies of the retina in humans or in animals, comprising nucleic acids according to claim 7.

16. A method of preventing or treating at least one of cardiac pathologies, vascular pathologies, endocrine pathologies associated with anomalies in hormone secretion, muscle pathologies and/or pathologies of the retina in humans or in animals comprising administering a therapeutically effective amount of the pharmaceutical composition according to claim 15.

17. Procedure for screening substances capable of preventing or treating, in human or animal subjects, cardiac pathologies, vascular pathologies, endocrine pathologies associated with anomalies in hormone secretion, muscle pathologies and./or pathologies of the retina, characterized in that said substances are capable of modulating the activity of the potassium channel activated by polyunsaturated fatty acids, especially arachidonic acid, and by riluzole, the sequence of which is represented in the attached listing as SEQ ID No. 2.

18. Procedure according to claim 17, characterized in that variable quantities of a substance to be tested are brought into contact with cells expressing said potassium channel, and then the possible effects of said substance on the currents of said channel are measured by any suitable means.

19. Procedure for the diagnosis, in a human or animal subject, of a cardiac disease, a vascular disease, an endocrine disease associated with anomalies in hormone secretion, a muscle disease and/or a pathology of the retina which could involve a mechanosensitive potassium channel activated by polyunsaturated fatty acids, especially arachidonic acid, and by riluzole, characterized in that one determines in a biological sample from a patient the presence or absence of a mechanosensitive potassium channel the sequence of which is represented in the attached list as SEQ ID No. 2 or the gene coding this channel or a variant thereof.

20. Procedure according to claim 19, characterized in that said sample is brought into contact with an antibody or a mixture of antibodies against said potassium channel.